



Modified Electrolytes

Sodium Restricted Diets

General Description

Sodium is involved in the regulation of body fluids and is one of several factors known to affect blood pressure. Reported dietary intakes of sodium for adults in the United States range from 1800 to 5000 mg per day, depending on the method used and whether or not discretionary sodium was assessed. A safe minimum intake is estimated to be 500 mg sodium per day¹.

The primary source of sodium in the diet is sodium chloride. Roughly 85% of sodium intake is from salt and other sodium compounds added during processing and manufacturing, or naturally occurring in foods; the remaining 15% is from salt added during cooking and at the table. This discretionary salt intake can be as high as 2.2 g of sodium¹.

Conversions

1 teaspoon salt = 6 g NaCl = 2325 mg sodium

1 g sodium chloride (NaCl) = 387 mg sodium

23 mg sodium = 1 mEq sodium = 1 mmol sodium

1 mmol NaCl = 58.5 mg NaCl

Indications for Use

Blood pressure risk is now considered a continuum with several stages. The effect of sodium intake on blood pressure is influenced by an individual's sensitivity to salt. Since it is difficult to identify individuals with salt sensitivity, reduction of sodium intake is recommended for the general population². The Food and Nutrition Board recommends that daily intake of sodium chloride be limited to 6 g (2.4 g of sodium) or less for the general population³. This recommendation has been incorporated into the 1995 Dietary Guidelines for Americans, encouraging a moderate intake of sodium, with reference to the level of 2400 mg sodium listed as the Daily Value of the Nutrition Facts food labels⁴.

This level of sodium restriction is recommended especially for patients with hypertension (along with weight control, etc.). Although not all patients will respond to sodium restriction, moderate sodium restriction poses no hazards and may reduce potassium losses associated with diuretic therapy². Sodium restriction may also be beneficial for patients with edema due to cardiovascular or renal disease, for patients with ascites due to liver disease, for women with pregnancy-induced hypertension, and for patients undergoing therapy with steroid hormones.

Nutritional Adequacy

In comparison to the Recommended Dietary Allowances, diets moderately restricted in sodium are nutritionally adequate with the same exceptions as for the regular diet. Diets strictly limited in sodium (<1000 mg) may be deficient in calcium.

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Indications for Medical Nutritional Therapy

Recommended Levels of Sodium Restriction by Diagnosis

Diagnosis	Recommended Sodium Restriction (g)	Reference
Hypertension	2-3	2
Renal Disease		
<i>Renal Insufficiency</i>	2-4, variable with disease etiology and urine output	5
<i>Hemodialysis</i>	2-3	5
<i>Peritoneal Dialysis</i>	2-4	5
Cirrhosis/Ascites	.5-1 initially, liberalize as tolerated	6
Congestive Heart Failure	.5-1 initially, then 2-3	6
Pregnancy-induced HTN	2-3 (only if useful prior to pregnancy)	2

Levels of Sodium Restriction

3 to 4 g Sodium	(131-174 mEq)	Mild
2 to 3 g Sodium	(87-131 mEq)	Moderate
1 g Sodium	(43 mEq)	Strict
500 mg Sodium	(22 mEq)	Very Strict

Dietary Adjustments Needed to Achieve Various Levels of Sodium Restriction

Mild	3-4 g	<ol style="list-style-type: none"> 1. Omit added salt at meals. 2. Allow limited amounts of salt in cooking. 3. Omit most foods containing >400 mg sodium/serving.
Moderate	2-3 g	<ol style="list-style-type: none"> 1. Omit added salt at meals. 2. Omit salt in cooking. 3. Omit foods with >400 mg sodium/serving. 4. Limit foods with 200-400 mg sodium/serving.
Strict	1 g	<ol style="list-style-type: none"> 1. Omit added salt at meals. 2. Omit salt in cooking. 3. Omit foods with >250 mg sodium/serving. 4. Limit foods with >100-250 mg sodium/serving.
Very Strict	.5 g	<ol style="list-style-type: none"> 1. Omit added salt at meals. 2. Omit salt in cooking. 3. Omit foods with >100 mg sodium/serving. 4. Limit foods with >30 mg sodium/serving.

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500 mg Sodium (22 mEq) Diet

Food Groups	Servings/Day	Foods Allowed	Foods Not Allowed
Dairy	1 cup	Milk, LS cheese.	Buttermilk, chocolate milk, instant breakfast, yogurt, hot chocolate mix, regular cheese, cottage cheese.
Meat or Substitute	5 ounces	All meat, fish, or poultry, except as listed; LS peanut butter, LS tuna.	Any meat, fish, or poultry prepared or processed with sodium. Regular peanut butter, tuna.
Eggs	0-1 per day	All eggs except as listed.	Any prepared with sodium. Commercial egg substitute.
Potato or Substitute	As Desired	All potatoes, rice, and noodles except as listed.	Any prepared or processed with sodium.
Vegetables	As Desired	All LS vegetables except as listed.	Sauerkraut, beets, carrots, celery, pickles, LS tomato juice, tomato juice, LS vegetable juice, vegetable juice, and olives.
Fruit & Fruit Juices	As Desired	All fruit and fruit juices except as listed.	Dried apples.
Breads & Cereals	As Desired	LS bread, LS rolls, LS crackers, matzoh, LS cereals.	Regular bread, rolls, pretzels, crackers, and cereals.
Fats	As Desired	LS butter, LS margarine, LS mayonnaise, LS salad dressing, vegetable oil.	Regular butter, margarine, mayonnaise, salad dressing, and gravy, LS gravy.
Beverages	As Desired	Coffee, decaffeinated coffee, tea, carbonated beverages.	Flavored international coffees, electrolyte replacement beverages.
Soup	0-1 Serving/Day	LS broth, LS soup made with allowed foods.	Bouillon, regular soup, and broth.
Desserts	As Desired	LS fruit pie, LS cookies, fruit ice.	Pie, cake, and cookies prepared with sodium. Ice cream, frozen yogurt, pudding. Regular or LS angelfood cake.

Sodium Restricted Diets

Sweets	As Desired	Sugar, honey, jelly, hard candy, jelly beans, marshmallows, pancake syrup.	Any prepared with sodium.
Miscellaneous	As Desired	LS spices, LS herbs, pepper, vinegar, LS catsup, lemon juice, dry mustard, salt substitute (with physician order only).	Salt, seasoned salt, regular catsup, prepared mustard, soy sauce, monosodium glutamate. Worcestershire sauce, steak sauce, prepared horseradish, tartar sauce, meat tenderizer.

Suggested Meal Plan

Breakfast	Lunch	Dinner
Juice	LS Meat or Substitute	LS Soup
LS Cereal	LS Potato or Substitute	LS Meat or Substitute
1 Egg or Substitute	Allowed LS Vegetable	LS Potato or Substitute
LS Toast	LS Salad/LS Dressing	Allowed LS Vegetable
LS Margarine	Fruit	LS Salad/LS Dressing
Jelly	LS Bread	Fruit or LS Dessert
Milk	LS Margarine	LS Bread
Beverage	Beverage	LS Margarine
		Beverage

1 gm Sodium (43 mEq) Diet

Food Groups	Servings/Day	Foods Allowed	Foods Not Allowed
Dairy	2 cup	Milk, LS cheese.	Buttermilk, chocolate milk, instant breakfast, yogurt, hot chocolate mix. Regular cheese, cottage cheese.
Meat or Substitute	As Desired	All meat, fish, or poultry, except as listed; LS peanut butter, LS tuna.	Any meat, fish, or poultry prepared or processed with sodium. Regular peanut butter.
Eggs	0-1 per day	All eggs as listed.	Any prepared with sodium. Commercial egg substitute.
Potato or Substitute	As Desired	All potatoes, rice, and noodles except as listed.	Any prepared or processed with sodium.

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Vegetables	As Desired	All LS vegetables except as listed.	Sauerkraut, pickles, tomato juice, LS tomato juice, LS vegetable juice, and olives.
Fruit & Fruit Juices	As Desired	All fruit and fruit juices.	None
Breads & Cereals	As Desired	LS bread, LS rolls, LS crackers, matzoh, LS cereals.	Regular bread, rolls, crackers, pretzels, pancakes, cereals, and french toast.
Fats	As Desired	LS butter, LS margarine, LS mayonnaise, LS salad dressing, vegetable oil.	Regular butter, margarine, mayonnaise, salad dressing, and gravy.
Beverages	As Desired	Coffee, decaffeinated coffee, tea, ginergale.	Flavored international coffees, electrolyte replacement.
Soup	0-1 Serving/Day	LS broth, LS soup made with allowed foods.	Bouillon, regular soup, and broth.
Desserts	As Desired	LS fruit pie, LS cookies, fruit ice.	Pie, cake, and cookies prepared with sodium. Ice cream, frozen yogurt, pudding. Regular or LS angelfood cake, flavored gelatin.
Regular or LS Sweets	As Desired	Sugar, honey, jelly, hard candy, jelly beans, marshmallows, pancake syrup.	Any prepared with sodium.
Miscellaneous	As Desired	LS spice, LS herbs, pepper, vinegar, LS catsup, lemon juice, dry mustard, salt substitute (with physician order only).	Salt, seasoned salt, regular catsup, prepared mustard, soy sauce, monosodium glutamate. Worcestershire sauce, steak sauce, prepared horseradish, tartar sauce, meat tenderizer.

Suggested Meal Plan

Breakfast	Lunch	Dinner
Juice	LS Meat or Substitute	LS Soup
LS Cereal	LS Potato or Substitute	LS Meat or Substitute
1 Egg or Substitute	Allowed LS Vegetable	LS Potato or Substitute
LS Toast	LS Salad/LS Dressing	Allowed LS Vegetable
LS Margarine	Fruit	LS Salad/LS Dressing
Jelly	LS Bread	Fruit
Milk	LS Margarine	LS Bread
Beverage	Beverage	LS Margarine
		Milk
		Beverage

Sodium Restricted Diets

2-3 g Sodium (87-103 mEq) Diet

Food Groups	Servings/Day	Foods Allowed	Foods Not Allowed
Dairy	2 cups	Milk, chocolate milk, hot chocolate mix, yogurt, LS* cheese.	Buttermilk, instant breakfast drink. Regular cheese, cottage cheese.
Meat or Substitute	As Desired	All meat, fish or poultry, except as listed; peanut butter, LS tuna.	Any meat, fish, or poultry prepared or processed with sodium. Regular tuna.
Eggs	0-1 per day	All eggs except as listed. Commercial egg substitute.	Any prepared with sodium.
Potato or Substitute	As Desired	All potatoes, rice, and noodles except as listed.	Any prepared or processed with sodium.
Vegetables	As Desired	All LS vegetables except as listed. LS tomato juice, LS vegetable juice.	Sauerkraut, pickles, tomato juice, and olives.
Fruit & Fruit Juices	As Desired	All fruit and fruit juices.	None.
Breads & Cereals	4 servings/day of regular bread, rolls, or doughnuts. Up to 1 cup reg cereal/day. LS bread and cereals as desired.	Regular bread, rolls, cereals, doughnuts or cakes within designated serving limits. LS bread, LS rolls, LS crackers, matzoh, LS cereals.	Regular crackers, pretzels, french toast, and pancakes. Commercial muffins.
Fats	6 servings/day of regular butter, margarine, mayonnaise, or cream cheese. LS fat as desired.	Regular margarine, butter, mayonnaise, cream cheese, within designated serving limits. LS butter, LS margarine, LS mayonnaise, LS salad dressing, vegetable oil, cream, LS gravy.	Salad dressing, regular gravy.
Beverages	As Desired	Coffee, decaffeinated coffee, tea, carbonated beverages.	Flavored international coffees, electrolyte replacement beverages.
Soup	0-1 Serving/Day	LS broth, LS soup made with allowed foods.	Bouillon, regular soup, and broth.

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Desserts	As Desired	LS pie, LS cookies, fruit ice, flavored gelatin. Ice cream should be included in dairy allowances.	Most pies, cakes, and cookies prepared or processed with sodium, instant pudding.
Sweets	As Desired	Sugar, honey, jelly, hard candy, jelly beans, marshmallows, pancake syrup.	Any prepared with sodium.
Miscellaneous	As Desired	LS spices, LS herbs, pepper, vinegar, LS catsup, mustard, salt substitute (with physician order only).	Salt, seasoned salt, regular catsup, soy sauce, mono-sodium glutamate, Worcestershire sauce, steak sauce, prepared horseradish, tartar sauce, and meat tenderizer.

Suggested Meal Plan

Breakfast	Lunch	Dinner
Juice	LS Meat or Substitute	LS Soup
LS Cereal	LS Potato or Substitute	LS Meat or Substitute
1 Egg or Substitute	LS Vegetable	LS Potato or Substitute
Toast	LS Salad/LS Dressing	LS Vegetable
Margarine	Fruit	LS Salad/LS Dressing
Jelly	Bread	Fruit
Milk	Margarine	Bread
Beverage	Beverage	Margarine
		Milk
		Beverage

Sodium Restricted Diets**3-4 gm Sodium (130.5-174 mEq) Diet**

Food Groups	Servings/Day	Foods Allowed	Foods Not Allowed
Dairy	2-4 cups	Milk, chocolate milk, hot chocolate mix, yogurt.	Buttermilk, instant breakfast drink.
	0-1 oz. per day	Cheddar or Hard cheese. LS* cheese.	Cottage cheese and other cheeses except listed.
Meat or Substitute	As Desired	All meat, fish, or poultry, except as listed; peanut butter, LS tuna.	Any meat, fish, or poultry prepared or processed with sodium. Regular tuna.
Eggs	0-2 Per Day	All eggs, commercial egg substitute.	None.
Potato or Substitute	As Desired	All potatoes, rice, and noodles except as listed. LS potato chips.	Potato chips. Commerical rice and pasta mixes.
Vegetables	As Desired	All fresh or plain frozen vegetables, LS tomato juice, LS vegetable juice.	Canned vegetables with sodium added, sauerkraut, pickles, tomato juice, vegetable juice, olives.
Fruit & Fruit Juices	As Desired	All fruit and fruit juices.	None.
Breads & Cereals	As Desired	Bread, rolls, LS crackers, matzoh, cereals, doughnuts, pancakes, and french toast.	Salted crackers, pretzels.
Fats	As Desired	Margarine, butter, mayonnaise, LS salad dressing, vegetable oil, LS gravy.	Regular gravy.
	Up to 1 pkt/day	Regular salad dressing.	
Beverages	As Desired	Coffee, decaffeinated coffee, tea, carbonated beverages. Flavored international coffees, electrolyte replacement beverages.	
Soup	1 Serving/Day	LS broth, LS soup made with allowed foods.	Bouillon, regular soup, and broth.
Desserts	Limit to 2 servings/day	Pie, cake, cookies, fruit ice, ice cream, frozen yogurt, pudding, flavored gelatin.	None.

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Sweets	As Desired	Sugar, honey, jelly, hard candy, jelly beans, marshmallows, pancake syrup, chocolate.	None.
Miscellaneous	As Desired	LS spices, LS herbs, pepper, vinegar, LS catsup, lemon juice, mustard, salt substitute (with physician order only).	Salt, seasoned salt, regular catsup, soy sauce, mono-sodium glutamate, Worcestershire sauce, steak sauce, prepared horseradish, tartar sauce and meat tenderizer.

Suggested Meal Plan

Breakfast	Lunch	Dinner
Juice	Meat or Substitute	LS Soup
Cereal	Potato or Substitute	Meat or Substitute
1 Egg or Substitute	Vegetable	Potato or Substitute
Toast	Salad/LS Dressing	Vegetable
Margarine	Fruit	Salad/Dressing
Jelly	Bread	Fruit or Dessert
Milk	Margarine	Bread
Beverage	Beverage	Margarine
		Milk
		Beverage

References

1. Food and Nutrition Board, National Research Council: Recommended Dietary Allowances. Washington, D.C., National Academy of Sciences, 10th edition. 1989.
2. National High Blood Pressure Education Program. The fifth report of the joint national committee on detection, evaluation, and treatment of high blood pressure. NIH publication No. 93-1088. January 1993.
3. National Research Council. 1989. Diet and Health: Implications for Reducing Chronic Disease Risk. Report of the Committee on Diet and Health, Food and Nutrition Board. National Academy Press, Washington, D.C. 750 pp.
4. U.S. Department of Agriculture, Agricultural Research Service, Dietary Guidelines Advisory Committee. 1995. Report of the dietary guidelines advisory committee on the dietary guidelines for Americans, 1995, to the Secretary of Health and Human Services and the Secretary of Agriculture, 58 pp.
5. Beto J. Which diet for which renal failure: making sense of the options. J Am Diet Assoc. 1995; 95:898-903.
6. Shils M E, Olson J A, Shike M, eds. Modern Nutrition in Health and Disease. 8th ed. Malvern, Pa: Lea & Febiger; 1994.

Sodium Restricted Diets

Table 4: Dietary Adjustments to Achieve Various Levels of Sodium Intake

